Influence of Persuasive Messages and Behavioural Factors through Behavioural Desire towards Behavioural Intention in Energy Saving Campaign

อิทธิพลของสารเพื่อการโน้มน้าวใจและปัจจัยเชิงพฤติกรรม ส่งผ่านความปรารถนาเชิงพฤติกรรม มีผลต่อความตั้งใจเชิงพฤติกรรมในโครงการรณรงค์ประหยัดพลังงาน

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Abstract

The objectives of this study were to: (1) study influence of persuasive messages and behavioural factors through behavioural desire towards behavioural intention in energy saving campaign, and (2) study the relationships among persuasive messages and behavioural, behavioural desire, and behavioural intention in energy saving campaign under the moderator variable of environmental attitude-based segmentation. The main theory of this study was based on the Extended Model of Goal-Directed Behaviour (EMGB), which proves the effect of persuasive messages underpinned by Prospect Theory and Elaboration Likelihood Model (ELM) to promote behavioural factors, and behavioural desire towards behavioural intention. In addition, the New Environmental Paradigm (NEP) Scale was applied for investigating the differences of environmental attitude-based segmentation.

This study was quantitative research and used purposive sampling method to collect data from 400 Thai respondents, who have seen Earth Hour 2017 web banner. The structural equation modeling using the AMOS program was applied to analyze the data. The first objective found that persuasive messages of gain message framing and behavioural factors of negative anticipated emotion and goal desire were positive effect on behavioural desire, and behavioural desire was effect on behavioural intention with the statistical significance. The second objective found that respondents who were divided into two different consciousness groups of environmental in high and low attitude-based segmentation, past behavior, and goal desire were effect on behavioural desire and behavioural intention with the statistical significance.

Moreover, gain message framing and negative anticipated emotion were positive effect on behavioural desire and behavioural intention of high environmental consciousness group. This study can be the guidelines for social marketers and creative of nonprofit organisation to create an effective messaging strategy and specify target group before launching environmental campaign.

Keywords: Persuasive Messages, Behavioral Factors,
Environmental Attitude-Based Segmentation,
Behavioral Intention in Energy Saving Campaign

บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อ (1) ศึกษาอิทธิพลของสารเพื่อการโน้มน้าวใจและปัจจัยเชิงพฤติกรรมที่ส่งผ่านความปรารถนาเชิงพฤติกรรม มีผลต่อความตั้งใจเชิงพฤติกรรมในโครงการรณรงค์ประหยัดพลังงาน และ (2) ศึกษาความสัมพันธ์ระหว่างตัวแปรสารเพื่อการโน้มน้าวใจและปัจจัยเชิงพฤติกรรม ความปรารถนาเชิงพฤติกรรม และความตั้งใจเชิงพฤติกรรม โดยแบ่งกลุ่มตามทัศนคติต่อสิ่งแวดล้อมเป็นตัวแปรกำกับ ทฤษฎีหลักของงานวิจัยนี้มีพื้นฐานจากทฤษฎี Extended Model of Goal-Directed Behaviour: EMGB ในการตรวจสอบความสัมพันธ์ของสารเพื่อการโน้มน้าวใจตามแนวความคิดทฤษฎีคาดหวัง (Prospect Theory) และแบบจำลอง Elaboration Likelihood Model: ELM ปัจจัยเชิงพฤติกรรม และความปรารถนาเชิงพฤติกรรม ที่มีผลต่อความตั้งใจเชิงพฤติกรรม นอกจากนี้ มาตรวัด New Environmental Paradigm (NEP) ถูกนำมาใช้เพื่อการแบ่งกลุ่มตามความคิดทางสิ่งแวดล้อม

งานวิจัยนี้เป็นงานวิจัยเชิงปริมาณ และใช้การสุ่มตัวอย่างแบบเจาะจง จำนวน 400 คน จากผู้ตอบแบบสอบถามชาวไทยที่เคยเห็นแบนเนอร์โฆษณาบนเว็บของ Earth Hour 2017 โดยวิเคราะห์ข้อมูลด้วยแบบจำลองสมการโครงสร้างด้วยโปรแกรม AMOS ผลการศึกษาของวัตถุประสงค์ที่ 1 พบว่าปัจจัยกรอบข่าวสารเชิงได้รับ อารมณ์ที่คาดการณ์ไว้เชิงลบ และความปรารถนาตามเป้าหมาย มีความสัมพันธ์ทางบวกต่อความความปรารถนาเชิงพฤติกรรม และความปรารถนาเชิงพฤติกรรมมีความสัมพันธ์ทางบวกต่อความตั้งใจเชิงพฤติกรรมอย่างมีนัยสำคัญทางสถิติ และ ผลการศึกษาของวัตถุประสงค์ที่ 2 พบว่ากลุ่มตามความคิดทางสิ่งแวดล้อมถูกแบ่งออกเป็นสองกลุ่ม กลุ่มที่มีความตะหนักต่อสิ่งแวดล้อมสูง และกลุ่มที่มีความตะหนักต่อสิ่งแวดล้อมต่ำ พฤติกรรมในอดีต และความปรารถนาตามเป้าหมาย มีความสัมพันธ์ต่อความปรารถนาเชิงพฤติกรรมอย่างมีนัยสำคัญทางสถิติ นอกจากนี้ ปัจจัยกรอบข่าวสารเชิงได้รับ อารมณ์ที่คาดการณ์ไว้เชิงลบ มีความสัมพันธ์ทางบวกต่อความปรารถนาเชิงพฤติกรรมอย่างมีนัยสำคัญทางสถิติ เฉพาะกลุ่มที่มีความตระหนักต่อสิ่งแวดล้อมสูง งานวิจัยนี้สามารถใช้เป็นข้อแนะนำสำหรับนักการตลาดเพื่อสังคมและผู้สร้างสรรค์งานโฆษณาสำหรับองค์กรที่ไม่แสวงผลกำไร เพื่อสร้างกลยุทธ์สร้างสรรค์สารที่มีประสิทธิภาพและเรียนรู้พฤติกรรมของกลุ่มเป้าหมาย ให้เหมาะสมก่อนออกโครงการรณรงค์เพื่อสิ่งแวดล้อม

คำสำคัญ: สารเพื่อการโน้มน้าวใจ ปัจจัยเชิงพฤติกรรม การแบ่งกลุ่มตามทัศนคติต่อสิ่งแวดล้อม
ความตั้งใจเชิงพฤติกรรมในโครงการรณรงค์ประหยัดพลังงาน

Introduction

For the past two decades, the big issue in Thailand is the environmental problem, especially energy saving campaign of Thailand 20-year Energy Efficiency Development Plan (2011-2030). Most expenditure (79%) is used to promote environmental projects whereas only 8.3 percent was used to build awareness and to encourage behavioural change (Ministry of Energy, 2011). The additional suggestion of Tantivejkul (2012) said that most creative agencies in Thailand developed advertising campaigns to raise awareness and change attitudes, but rarely changed behavior. And they rarely considered the extent to which their persuasive messages change behaviour and convince the right audiences who have different attitudes and lifestyles in environmental campaigns (Tantivejkul, 2012). Since the 1980s, improvement in the marketing field consists of the well-being of communities, environmental protection, global warming or saving energy concerns, the safety and the quality of health care, etc., which have rapidly expanded around the world, many people believe in the social mission and engage in social behavior (Lefebvre, 2013). According to the concept of social marketing, which is defined as the application of marketing principles and communication principles to achieve socially desirable goals, which are not organisational goals, through changes in consumer behavior (Lee & Kotler, 2019). The previous researches have most frequently examined effective social marketing based on a Theory of Planned Behaviour (TPB) (Truong, Garry & Hall, 2014; Ajzen, 1991). But the cause of the TPB is used in the past that is not enough to predict behavioural intention. So, researchers have proposed additions to the TPB addressing four main areas of improvement over the TPB identified as past behaviour, anticipated emotions, goal desire, and behavioural desire in the framework of the Extended Model of Goal-Directed Behaviour (EMGB) (Perugini & Conner, 2000). Based on social marketing communication which delivers social values rather than product or service benefits to the target audience (Lee & Kotler, 2019), this study focuses on the behavioural change at the individual level and persuasive communication is considered as an effective tool to influence the decision of target audiences to enhance behavioural change.

The significance of this study in the context of marketing campaign is to improve persuasive messages by testing the theory of the Extended Model of Goal-Directed Behaviour (EMGB) in changing individual behaviour. The integrative theories of Prospect theory (Kahneman & Tversky, 1979) and the Elaboration Likelihood Model (ELM) (Petty & Cacioppo, 1986) explain the processing that takes place in relation to attitude, beliefs, and persuasive communication. Indeed, sending the right message to the right target can be critical to the success of a campaign, each campaign of environmental protection may be classified to different groups by the environmental attitude-based segmentation based on the New Ecological Paradigm (NEP) Scale (Dunlap, Van Liere, Mertig, & Jones, 2000).

Research Objectives

This research aims to investigate the behavioural change of energy saving campaign influenced by persuasive messages and behavioural factors. The first objective was to investigate the influence of persuasive messages-gain and loss message framing, positive and negative emotional message appeal, descriptive and injunctive normative message, and self-efficacy-message on Earth Hour 2017 web banner were considered that is event of the world's largest grassroots movement for the environment, harnessing the facility of the collective to impact global climate change. And investigation of behavioural factors included past behaviour, positive and negative anticipated emotion, goal desire, and their behavioural desire influencing behavioural intention. The second objective was to understand the moderating effect of environmental attitude-based segmentation on the relationship between behavioural desire and behavioural intention.

Literature Review

Extended Model of Goal-Directed Behaviour (EMGB)

The EMGB model was developed by Perugini and Conner (2000) to extend the Theory of Planned Behaviour (TPB) as a well-known theory (Ajzen, 1991) and the Model of Goal-Directed Behaviour (MGB) as the previous theory (Perugini & Bagozzi, 2001) that the EMGB is better predictive power of intention than the TPB and stronger predictive power of behavioural desire than the MGB (Richetin, Perugini, Adjali & Hurling, 2008). The EMGB model consisted of independent variables (attitude, subjective norms, perceived behavioural control, past behaviour, positive and negative anticipated emotions, and goal desire), mediator variable (behavioural desire), and dependent variable (behavioural intention) (Perugini & Conner, 2000). The integrative theories of Prospect theory (Kahneman & Tversky, 1979), Elaboration Likelihood Model (ELM) (Petty & Cacioppo, 1986), and Extended Model of Goal-Directed Behaviour (EMGB) (Perugini & Bagozzi, 2001), are used in an explanation of the independent variables regarding to attitude, subjective norms, and perceived behavioural control which are applied for the variables of Persuasive Messages (Message Framing, Message Appeal, Normative Message, Self-Efficacy Message). And the EMGB also is used in an explanation of the rest of independent variables regarding to past behaviour, positive and negative anticipated emotions, and goal desire which are applied for the variables of Behavioural Factors, mediator variable (Behavioural Desire), and dependent variable (Behavioural Intention). The moderating role of environmental attitude-based segmentation is based on the New Ecological Paradigm (NEP) Scale.

Independent Variables of EMGB:

Persuasive Messages: Message Framing, Message Appeal, Normative Message, Self-Efficacy Message

To explain the process regarding persuasive messages by using each of the three theories of Prospect theory, the Elaboration Likelihood Model (ELM), and the Extended Model of Goal-Directed Behaviour (EMGB). Prospect theory explains message framing, ELM theory explains message appeal, and EMGB theory explains normative message and self-efficacy message.

The first variable of EMGB is attitude that impacts individual's intention and actual behaviour (Perugini & Bagozzi, 2001) as the relationship of the environmental attitude and behavioural intention will be stronger (Cheung, Chan & Wong, 1999). Conner and Armitage (1998) said that the possible investigation of the incorporation of the TPB into the ELM integrated with Prospect theory should provide a more comprehensive model to enhance understanding of the attitude-behaviour relationship. Kotler and Keller's typology can be applied equally to social advertising campaigns (informational and emotional appeals) to examine the relative effectiveness of each appeal in a pro-environmental context in terms of encouraging the adoption of a new behaviour. Two theories are integrated with Prospect Theory and Elaboration

Likelihood Model (ELM) for information and emotional messages (Noble, Pomering & Johnson, 2014). The ELM verifies that attitude change can result from one of two routes: either from the judgment of relevant information (i.e. central route to persuasion), or from less effort (i.e. peripheral route to persuasion) (Petty & Cacioppo, 1986). For Prospect theory (Kahneman & Tversky, 1979), the framing basis based on behavioural economic theory that the way people select alternatives of probability involving risk before making decision. Researchers apply this theory to explain the effects of framing on message-based persuasion. People evaluate message in terms of either potential gain or loss framing affecting attitude and behavioural changes. When tying these ideas to the ELM (Petty & Cacioppo, 1986), the effects of message matching can lead to persuasion through the central route due to persuasive messages being framed to match the recipient's concern, people will pay closer attention to the message (Briñol & Petty, 2006). Alternatively, message matching may increase persuasion through a peripheral route of the ELM, where subjective feeling right and perceived ease can be attributed to the message topic without increasing any elaboration of the message. Therefore, this study examines the effectiveness of messages of informational ad appeal (facts) in framing effects (gain or loss message framing) and emotional ad appeal (positive or negative emotional message appeal) in influencing behavioural intention.

The second variable of EMGB is subjective norms or social norms, which is defined as an individual's perceptions about what behaviour should be performed (Perugini & Bagozzi, 2001). Social norms consist of descriptive norms and injunctive norms. Descriptive norm refers to people's perceptions of how other people are doing whereas injunctive norm refers to people's perceptions specifying behaviour of what people ought to approve or disapprove, this norm would be the morals of social networks (Cialdini, Reno & Kallgren, 1990; Cialdini, Demaine, Sagarin, Barrett, Rhoads & Winter, 2006). Cialdini et al. (1990) states that both descriptive and injunctive norms are used in persuasive normative messages to increase the saliency of norms and motivate pro-environmental behaviour, that is, acting on considerations of what is the right or wrong thing to do for the community and the environment.

The third variable of EMGB is perceived behavioural control (PBC) or self-efficacy, which is operationalised perceived behavioural control using measures of both difficulty and control on a unidimensional scale (Perugini & Bagozzi, 2001). It means to measure one's belief regarding one's own competence to complete a task and reach goals. In the study of behaviour, the demonstrations of persuasive messages in terms of self-efficacy do affect behavioural change.

Behavioural Factors: Past Behaviour, Positive and Negative Anticipated Emotions, Goal Desire

Since the EMGB focuses on additional four main areas of improvement over the TPB identified as automatic processes, affective processes, motivational processes, and means-end analyses to provide a fuller understanding of decision making than the TPB. The fourth variable of EMGB is past behaviour that becomes an automatic response to perform behaviour so that information searching for finding alternative choices would be reduced (Verplanken, Aarts & Van Knippenberg, 1997). The fifth variable of EMGB is anticipated emotions which refer to positive emotion or negative emotion in succeeding or failing a certain goal for which behaviour is changed. The sixth variable of EMGB is goal desire which represents the commitment to achieve a certain goal that will influence behaviour.

Mediator Variable of EMGB: Behavioural Desire

The seventh variable of EMGB is a behavioural desire which represents the driving motivation towards intention that individual is desirable or undesirable to perform the intention. According to Perugini and Bagozzi (2001), TPB pays insufficient attention to decision making in terms of motivational processes to perform intention. Because attitude, subjective norms, and perceived behavioural control can provide behavioural change but they do not incorporate a motivation to drive an intention. So, behavioural desire, which is affected by attitude, subjective norms, and perceived behavioural control, anticipated emotions, goal desire, and past behaviour, has a positive relationship with behavioural intention.

Dependent Variable of EMGB: Behavioural Intention

The eight variable of EMGB is behavioural intention. Based on the EMGB attempted to deepen and broaden the concept of volition of the TPB comprising elements of the attitude, subjective norms, and perceived behavioural control, past behaviour, anticipated emotions, and goal desire on behavioural desire mediating intention and behaviour in the future (Perugini & Bagozzi, 2001).

Moderator Variable: Environmental Attitude-based Segmentation

Sending the right message to the right target can be critical to campaign success. Each campaign of environmental protection i.e. energy saving may be classified to different groups or segmentation process to define a target group which may be demographics, psychographics, and behaviours which are often considered. Several studies have attempted to identify psychographic correlates of environmental attitudes and behaviour as the relationship is the more consumers' environmental involvements are, the more their adoption behavior (Scott & Willits, 1994). The most commonly employed construct for measuring environmental attitude or concern, which measures individuals' environmental attitudes based on a link of human and environment, is the new environmental paradigm (NEP) as proposed by Dunlap et al. (2000).

Research Hypotheses

There were nine hypothesis statements for this research study.

H1a: Gain Message Framing (GFE) influences Behavioural Desire (BD)

H1b: Loss Message Framing (LFE) influences Behavioural Desire (BD)

Prospect theory suggests that gain-framed and loss-framed persuasive appeals will depend on decision making between alternatives involving the benefit and the risk (Kahneman & Tversky, 1979). In the specific domain of environmental communications, Australians will reduce carbon dioxide emission when income increases in the future, are gain framed, or income decreases in the future are loss framed (Hurlstone, Lewandowsky, Newell & Sewell, 2014). Obermiller (1995) also showed the result that loss message framing is more effective for the negative consequences of energy conservation than gain message framing, whereas gain message framing is more effective for the positive consequences of recycling loss message framing.

H2a: A Positive Emotional Message Appeal (PEA) influences Behavioural Desire (BD)

H2b:A Negative Emotional Message Appeal (NEA) influences Behavioural Desire (BD)

The ELM classifies message appeals can be divided into two categories which are informational and emotional appeals (Petty & Cacioppo, 1986). For emotional appeal, brings out emotional responses when the environmental message is a range of positive and negative emotional appeals. In terms of behavioural change in social marketing campaign, Lukic and Flyholm (2009) found that negative emotional message appeal is more effective on personal issue campaigns than societal issue campaigns, in which more positive emotional message appeal is more effective on societal issue campaigns than personal issues campaigns to adapt behaviour and these were employed.

H3a: A Descriptive Normative Message (DNE) influences Behavioural Desire (BD)

H3b: An Injunctive Normative Message (INE) influences Behavioural Desire (BD)

In the EMGB, social norm provides that individuals are persuaded based on descriptive and injunctive norms (Perugini & Bagozzi, 2001). A study by Cialdini et al (2006) showed that emphasising injunctive normative message to influence behaviour of natural reservation rather than descriptive normative message. Whereas Cialdini et al. (1990) found the descriptive norm is effective and able to influence behaviour in reducing littering in public places. And Nolan, Schultz, Cialdini, Goldstein & Griskevicius (2008) found that descriptive message were effective and able to influence environmental behaviour.

H4: A Self-Efficacy Message (SE) influences Behavioural Desire (BD)

A study by van Zomeren, Spears and Leach (2010) attempted to increase an individual's level of self-efficacy by adopting a fear model and an accompanying fear stimulus with a self-efficacy statement. Individuals change their behaviour to prevent the climate crisis in the future. Hively (2006) showed the benefit of using self-efficacy statements in promotional health messages to improve behavioural intentions of stubborn college students and also decrease their defensive reactions to these given messages.

H5: Past Behaviour (PB) influences Behavioural Desire (BD)

As the result of Knussen, Yule, MacKenzie and Wells (2004) showed that there is a stronger effect of past behaviour on intention for individuals who have habitual past recycling behaviour than no perceived habit of recycling. Individuals who have ever performed a stronger past behaviour, they will have stronger intentions to perform the behaviour in future.

H6a: Positive Anticipated Emotion (PAM) influences Behavioural Desire (BD)

H6b: A Negative Anticipated Emotion (NAM) influences Behavioural Desire (BD)

In the EMGB, anticipated emotions represent positive and negative emotions to measure anticipated feeling (Perugini & Bagozzi, 2001). As the result of Rothman and Salovey (1997) suggested positive or negative anticipated emotions play a more important role in decision making processes which may depend on the kind of behaviour (e.g. whether it is a preventive or a detective behaviour) or on the kind of person (e.g. whether one is promotion or prevention focused).

H7: Goal Desire (GD) influences Behavioural Desire (BD)

A study by Prestwich, Perugini, and Hurling (2008) examined the direct effect of goal desire on behaviour focusing on fruit intake and concerns with drinking alcohol. And the study of train travellers' intentions to use SMS conversation indicates past behaviour, goal desire to communicate, and controllable self-efficacy will influence the intention to conduct SMS conversation on a train (Tillema, Schwanen & Dijst, 2009).

H8: Behavioural Desire (BD) influences Behavioural Intention (BI)

In terms of behavioural change in social marketing campaign, if the individual has a high level of behavioural desire, their self-commitment will perform a high level of behaviour (Perugini & Bagozzi, 2001).

H9: The relative impacts of determinants predicting behavioural intention may vary depending on Environmental Attitude-Based Segmentation

For previous studies, understanding individual attitudes and the social context of environmental behaviour is important. Ogunbode (2013) also indicated that environmental attitudes are important determinants of ecological behaviour by using the NEP scale measurement. Figure 1 illustrates the conceptual framework of this study.

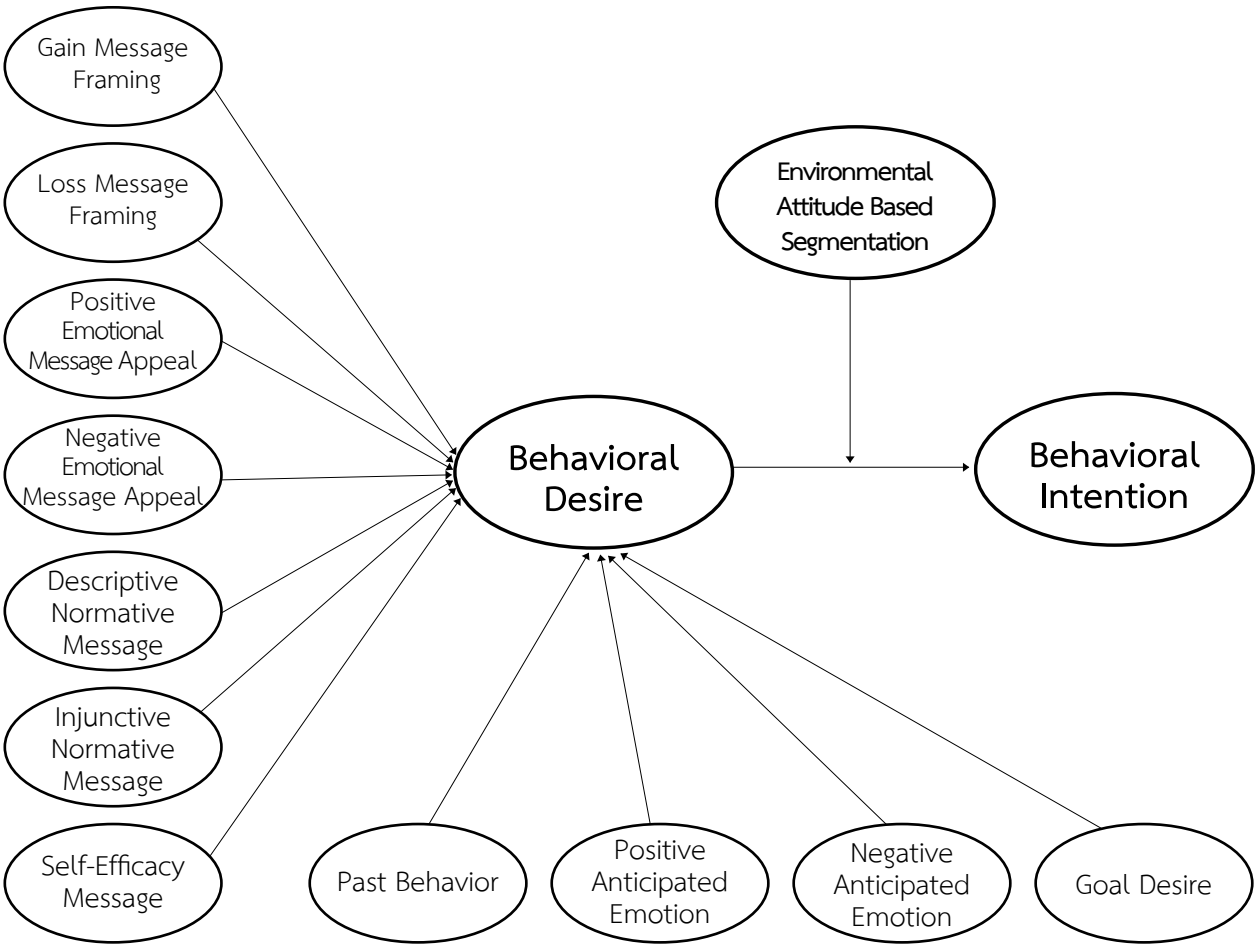

Figure 1: Conceptual Framework for the study (adapted from Perugini & Bagozzi, 2001)

Research Methodology

Sampling and Data Collection Procedure

To collect the data, a questionnaire was developed to survey Thai target respondents who have seen Earth Hour web banner and they may remember or may not remember headline messages. Earth Hour campaign is the world's largest grassroots movement for environment issues about climate change and energy saving that was established by Bangkok Metropolitan Administration, the World Wide Fund for Nature (WWF), the Foundation for Environmental Education for Sustainable Development (Thailand) and other agencies hosted the event at the main campaign venue at Central World IX department store on 25, March 2017. Sample size is considered prior to SEM analysis, although SEM requires a larger sample relative to other complex and advanced statistical techniques, but there is no certain rule of thumb for sample size. However, the sample size of this study is based on Taro Yamane formula (Yamane, 1973) with 95% confidence level for minimum number of samplings (0.05 margin of error), with 68.14 million Thai people according to 2016 population census, the sample size is 400 persons.

A purposive sampling method by using judgment sampling is considered to apply as a method to gather research samples. A total of 650 self-administered questionnaires were distributed in these two sampling frames due to campaigners and agencies mainly promoting "Earth Hour Campaign" on their web sites and events in Bangkok. Firstly, a total of 400 self-administered questionnaires were distributed since January-February 2017 at nine areas of Bangkok where this campaign was promoted such as Central World IX department store, Central Ramintra Department Store, Fashion Island Department Store, Baiyok Tower, AsiaTique Market, Tang Hua Seng Department Store, Seacon Bangkae Department Store, The Bright Rama II Market, and the Stupa of Wat Arun (Temple of Dawn). Secondly, a total of 250 self-administered questionnaires were distributed to internet users in Bangkok Metropolis since January-February 2017. From this initial number, 400 from 650 respondents were used as a sample for this study. A total of 250 questionnaires were eliminated as unusable because the respondents had never seen Earth Hour web banner 2017; which was the screening question.

Research Instrument/Questionnaire

According to the questionnaire development which based on measurements from various previous studies, are divided into 5 parts. First part is persuasive messages: Gain Message Framing consisting of three indicators (α= 0.93) and Loss Message Framing consisting of three indicators (α= 0.91) were guided by Prospect theory (Kahneman & Tversky, 1979), Positive Emotional Message Appeal consisting of three indicators (α= 0.89) and Negative Emotional Message Appeal consisting of three indicators (α = 0.89) were guided by the ELM (Petty & Cacioppo, 1986) and adapted from Noble et al. (2014) study, Descriptive Normative Message consisting of three indicators (α= 0.88), Injunctive Normative Message consisting of three indicators (α= 0.90), and Self-Efficacy Message consisting of three indicators (α= 0.92) were guided by the EMGB (Perugini & Conner, 2000) and adapted from Cialdini et al. (1990) study. Second part is behavioural factors: Past Behavior consisting of five indicators (α= 0.92), Positive Anticipated Emotion consisting of three indicators (α= 0.92), Negative Anticipated Emotion consisting of three indicators (α= 0.92), and Goal Desire consisting of three indicators (α= 0.95), and third and fourth part are Behavioral Desire consisting of four indicators (α= 0.98) and Behavioral Intention consisting of five indicators (α= 0.97) were guided by the EMGB (Perugini & Conner, 2000). And fifth part: Environmental Attitude Based Segmentation consisting of 15 indicators (α= 0.91) was guided by NEP scale (Dunlap et al., 2000). The measurement scale developed is an interval scale which excludes a demographic of the respondents. The respondents were asked to indicate their response to all questions on a scale of 1 to 5 consisting of 1 = strongly

disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree to 5 = strongly agree. The pre-test reliability results scale showed that 60 measurement items of 14 constructs used in the questionnaires, 50 questionnaires were distributed to the target respondents by applying the web-based questionnaire. Cronbach's Alpha ranging from between 0.804 to 0.982 are considered as reliable according to the cut-off point of 0.7 suggested by Hair, Black, Babin, Anderson & Tatham (2010). Content validity is made by using indexes of item-objective congruence (IOC). Three experts' opinions were gathered to measure whether or not/and in which degree the questionnaire contents were appropriate. The IOC index can be written as: IOC = ∑R/N, while R and N denote score for each questionnaire question and number of the scoring experts respectively. The results show that the IOCs for every question are higher than that of the criteria of 0.5.

Research Results

Demographic Profile of Respondents

The demographic profiles of a total of 400 respondents described their characteristics as the following: The majority of respondents are female at 66% whereas males represented only 34% of total respondents. For the age group, most respondents are aged between 25 and 34 years at 33.5%, followed by those aged between 18 and 24 years old at 29.5%, 35 to 49 years old at 28.75%, less than 18 years old at 5.75%, and more than 50 years old at 2.5%, respectively. For the educational level, the majority of respondents have graduated bachelor's degree at 66.25%. The rest of respondents have graduated lower than bachelor degree at 19.75% and higher than bachelor degree at 14%. As for the career, most respondents have held private office at 35.25%, followed by studied as student at 25.25%, public officer at 22.5%, business owner at 14.25%, housewife or househusband at 2.5%, and others at 0.25%, respectively. For income level, most respondents have got an income between 10,001 and 30,000 Baht at 54%, followed by income between 30,001 and 50,000 Baht at 24.5%, less than 10,000 Baht at 13.25%, and more than 50,000 Baht at 8.25%, respectively.

In terms of the respondents' behaviour, the duration most respondents have participated in energy saving campaign are less than 2 years at 36%. The rest of the respondents have never participated at 31.5%, between 2 and 4 years at 17.25%, and more than 4 years at 15.25%. For the frequency of energy saving activity participation, the frequency of most respondents who have participated in energy saving campaign is less than 5 times per year at 34.25%, followed by respondents who have never participated at 31%, between 5 and 10 times per year at 17.75%, and more than 10 times per year at 17%, respectively. As for media exposure, Online Media is the most important that respondents used for finding information. The rest of media exposures are TV/Radio, Billboard, Magazine/Newspaper, and Leaflet/Pamphlet, respectively. For environment-concerned activities, saving energy campaign is the most important that respondents are interested in participating in. The rest of environment-concerned activities are Recycling/Reusing, Pollution Reduction, Wildlife Conservation, and using Eco-Friendly Products, respectively.

Reliability Analysis and Confirmatory Factor Analysis

The reliability analysis presented that the Cronbach's Alpha's value ranged between 0.70 and 0.82 according to Hair et al. (2010) suggested that these criterion values are acceptable point. The model fit in the confirmatory factor analysis (CFA) can provide better results for the path analysis. There are two main types of goodness-of-fit measures that assess the overall fitness of the hypothesised model which are absolute fit measures and incremental fit measures. The first type of measures is an absolute fit measure which determines the degree to which the proposed model fits the observed covariance matrix, including statistical analysis of Chi-square statistic, Goodness-of-Fit Index (GFI), and the Root Mean Square Error of Approximation (RMSEA). The second type of measures is an incremental fit measure which compares the proposed model to some baseline model or null model. There are five indices in measuring incremental fit which are Tuker-Lewis Index (TLI), Normed Fit Index (NFI), Relative Fit Index (RFI), Incremental Fit Index (IFI), and Comparative Fit Index (CFI) (Hair et al., 2010; Ho, 2006).

The results of absolute fit measures of the measurement model are; $X^2/df = 1.53$, $p < 0.001$, GFI = 0.88 and RMSEA = 0.04 which are close to the recommended rule of thumb that $X^2/df < 2.0$, GFI > 0.9, and RMSEA <0.08 (Hair et al., 2010). In terms of incremental fit measures, the scores of baseline comparisons fit indices of NFI, RFI, IFI, TLI, and CFI are close to or exceed 0.9 (range: 0.82-0.94) which are close to the recommended rule of thumb (Hair et al., 2010). Given the range of the computed baseline comparison fit indices, the remaining possible improvement in the fit of the hypothesised model (range: 0.06-0.18) appears as small as to be of little practical significance.

Hypotheses Testing

Structural Equation Modelling (SEM) was used to investigate and explain the relationships among the predictor variables and dependent variables for hypothesis 1-8.

The results of absolute fit measures of the measurement model are; $X^2/df = 1.60$, $p < 0.05$, GFI = 0.87 and RMSEA = 0.04 which are close to the recommended rule of thumb (Hair et al., 2010). Chi-square and other statistics show that the model represent a satisfactory fit the data set. In terms of incremental fit measures, the scores of baseline comparisons fit indices of NFI, RFI, IFI, TLI, and CFI are close to or exceed 0.9 (range: 0.83-0.93) which are close to the recommended rule of thumb (Hair et al., 2010). Given the range of the computed baseline comparison fit indices, the remaining possible improvement in the fit of the hypothesised model (range: 0.07-0.17) appears as small as to be of little practical significance. Therefore, the baseline fit indices have indicated a satisfactory fit for the structural model as most of the indices are close to the recommended point. Furthermore, this table demonstrates the square multiple correlations of this structural model. For this hypothesised model, 26.5% of the variation in behavioural desire is unexplained; alternatively, 73.5% of the variance is accounted for by the joint influence of persuasive messages and behavioural factors. Similarly, 7% of the variation in the support for behavioural intention is unexplained; alternatively, 93% of the variance is accounted for by the joint influence of persuasive messages and behavioural factors.

According to path model for the prediction of behavioural intention, Table 1 summarises the hypothesis testing results of this study.

Table 1 Structural Relationships between persuasive messages, behavioural factors, behavioural desire and behavioural intention

No.	Structural Path	β	C.R.	Results
H1a	GFE → BD	0.13*	2.25*	Supported
H1b	LFE → BD	-0.05	-1.20	Not Supported
H2a	PEA → BD	-0.08	-1.55	Not Supported
H2b	NEA→ BD	0.01	0.32	Not Supported
H3a	DNE→ BD	0.01	0.15	Not Supported
H3b	INE → BD	0.02	0.42	Not Supported
H4	SE → BD	0.11	1.73	Not Supported
H5	PB → BD	0.11	0.86	Not Supported
H6a	PAM → BD	0.15	1.91	Not Supported
H6b	NAM → BD	0.15**	2.89**	Supported
H7	GD → BD	0.43***	5.98***	Supported
H8	BD → BI	0.81***	9.49***	Supported

Note: ***p<0.001, **p<0.01, * p<0.05, Not Supported = not significant

As mentioned in Hypothesis 9, environmental attitude-based segmentation is classified by multi-group analysis which is conducted for both measurement model and the structural path model in order to examine the group difference in influencing intention to change behaviour. Since, the average NEP score is 3.52; any score above 3.52 indicates progressively higher agreement with a pro-environmental stance or respondents show a positive tendency toward an environmental worldview, while scores below 3.52 indicate increasing levels of disagreement with the idea that humans are negatively impacting the global environment. Therefore, 400 respondents were then divided into two groups, the first group about 202 respondents representing “high environmental consciousness” and the second group about 198 respondents representing “low environmental consciousness”.

Multi-Group Analysis

For the confirmatory factor analysis of multi-group between high environmental consciousness and low environmental consciousness, the model includes the latent construct of persuasive messages and behavioural factors as the antecedents, behavioural desire as the mediator variable, and behavioural intention as the consequence. For the group invariant model, there are 304 parameters to be estimated. This model, therefore, has 1766 (2070 - 304) degrees of freedom, and yielded a significant chi-square value, X^2 (N=400, df = 1766) = = 2746.76, $p < 0.05$. The results of absolute fit measure are $X^2/df = 1.56$, $p < 0.05$, GFI = 0.79 and RMSEA = 0.04 which show a moderate level of satisfactory fit. In terms of incremental fit measures, the scores of baseline comparisons fit indices of CFI = 0.86, TLI = 0.84, and IFI = 0.86 which are close to or exceed 0.9 and fall in a consideration of acceptable value according to the recommended rule of thumb (Hair et al., 2010). For the group variant model, there are 336 parameters to be estimated. This model, therefore, has 1734 (2070 - 336) degrees of freedom, and yielded a significant chi-square value, X^2 (N=400, df = 1734) = 2704.71, $p < 0.05$. The results of absolute fit measure are $X^2/df = 1.56$, $p < 0.05$, GFI = 0.79 and RMSEA = 0.04 which show a moderate level of satisfactory fit.

In terms of incremental fit measures, the scores of baseline comparisons fit indices of CFI = 0.86, TLI = 0.84, and IFI = 0.87 which are close to or exceed 0.9 and fall in a consideration of acceptable value according to the recommended rule of thumb (Hair et al., 2010). For NFI and RFI are not recommended for samples less than 200 that may be underestimating fit (Kline, 2005).

Therefore, the fit of two competing models can be directly compared. From the nested model comparisons statistics, it can be seen that the chi-square difference value for the two models is 42.053 (2746.758-2704.705). With 32 degrees of freedom (336-304), this value is not significant at the 0.05 level. Although the two models do not differ significantly in their goodness-of-fit, the fit of the two models can also be compared using the AIC measure. In evaluating the hypothesised model, this measure takes into account both model parsimony and model fit. The AIC measure for the group invariant model (3354.76) is smaller than that for the group variant model (3376.71), indicating that the group invariant model is both more parsimonious and better fitting than the group variant model.

The path model of multi-group modelling for High Environmental Consciousness and Low Environmental Consciousness

There are two data sets for high and low environmental consciousness, each containing 45 measurement variables. The two covariance metrics generated from the two data sets contain 2070 sample moments. For the group invariant model, there are 270 parameters to be estimated. This model, therefore, has 1800 (2070 - 270) degrees of freedom, and yielded a significant chi-square value, X^2 (N=400, df = 1800) = 2882.00, $p < 0.05$ (both models yielded poor fit by the chi-square goodness-of-fit test). The results of absolute fit measure are $X^2/df = 1.60$, $p < 0.05$, GFI = 0.78 and RMSEA = 0.04 which show a moderate level of satisfactory fit. In terms of incremental fit measures, the scores of baseline comparisons fit indices of CFI = 0.84, TLI = 0.83, and IFI = 0.85 which are close to or exceed 0.9 and fall in a consideration of acceptable value according to the recommended rule of thumb (Hair et al., 2010). For the group variant model, there are 282 parameters to be estimated. This model, therefore, has 1788 (2070 - 282) degrees of freedom, and yielded a significant chi-square value, X^2 (N=400, df = 1788) = 2831.86, $p < 0.05$ (both models yielded poor fit by the chi-square goodness-of-fit test). The results of absolute fit measure are $X^2/df = 1.59$, $p < 0.05$, GFI = 0.78 and RMSEA = 0.04 which show a moderate level of satisfactory fit. In terms of incremental fit measures, the scores of baseline comparisons fit indices of CFI = 0.85, TLI = 0.83, and IFI = 0.85 which are close to or exceed 0.9 and fall in a consideration of acceptable value according to the recommended rule of thumb (Hair et al., 2010). For NFI and RFI are not recommended for samples less than 200 that may be underestimating fit (Kline, 2005).

Therefore, the fit of two competing models can be directly compared. From the nested model comparisons statistics, it can be seen that the chi-square difference value for the two model is 50.135 (2881.997- 2831.862). With 12 degrees of freedom (282-270), this value is significant at the 0.05 level ($p < 0.05$). Thus, the two models have significant difference in term of goodness-of-fit. The fit of the two models can also be compared using the AIC measure. In evaluating the hypothesised model, this measure takes into account both model parsimony and model fit. The AIC measure for the group invariant model (3422.00) is larger than that for the group variant model (3399.86), indicating that the group variant model in which high and low environmental consciousness are hypothesised to have different regression weights, is both more parsimonious and better fitting than the group invariant model. The result of Nested Model Comparisons present significant value, as well as, the AIC value of the invariant model is higher in which there is a consistency

between the results of Nested Model Comparisons and AIC measure. This is important for assessing mean difference of the latent variable across groups, so it can be summarised that there is group differences between high and low environmental consciousness on intention to change behaviour.

According to of multi-group modelling for High and Low Environmental Consciousness, Table 2 summarises the hypothesis testing results of this study.

Table 2 Structural Relationships between persuasive messages, behavioural factors, behavioural desire and behavioural intention for two groups

No.	Structural Path	β		C.R.		Results	
		1st Group	2nd Group	1st Group	2nd Group	1st Group	2nd Group
H1a	GFE → BD	0.40**	0.03	2.64**	0.55	Supported	Not Supported
H1b	LFE → BD	0.04	-0.10	0.48	-1.87	Not Supported	Not Supported
H2a	PEA → BD	-0.15	-0.07	-1.28	-1.22	Not Supported	Not Supported
H2b	NEA → BD	-0.12	0.10	-1.12	1.73	Not Supported	Not Supported
H3a	DNE → BD	0.05	-0.02	0.53	-0.25	Not Supported	Not Supported
H3b	INE → BD	0.24	-0.11	1.88	-1.76	Not Supported	Not Supported
H4	SE → BD	0.19	0.04	1.64	0.54	Not Supported	Not Supported
H5	PB → BD	-0.52*	0.60**	-2.26*	3.08**	Supported	Supported
H6a	PAM → BD	0.24	0.03	1.62	0.24	Not Supported	Not Supported
H6b	NAM → BD	0.36***	0.02	3.63***	0.27	Supported	Not Supported
H7	GD → BD	0.35***	0.21**	4.11***	2.84**	Supported	Supported
H8	BD → BI	0.83***	0.97***	8.23***	7.28***	Supported	Supported

Note: ***p<0.001, **p<0.01, * p<0.05, Not Supported = not significant.

Discussions and Conclusions

This study has fulfilled the two main research objectives. The first objective was to investigate the influence of persuasive messages—gain and loss message framing, positive and negative emotional message appeal, descriptive and injunctive normative message, and self-efficacy message—on Earth Hour 2017 web banner. And investigation of behavioural factors includes positive and negative anticipated emotion, goal desire, past behaviour, and their behavioural desire influencing behavioural intention. The results show that persuasive messages of gain message framing and behavioural factors of negative anticipated emotion and goal desire are important in influencing behavioural desire. This implies that respondents who see persuasive messages of Earth Hour 2017 web banner, in their opinions show that the strength of gain message framing or getting benefit will increases the positive response in the higher level of behavioural desire whereas loss message framing does not. This result is consistent with the previous studies which indicate gain message framing have a stronger effect than loss message framing on behaviour in social marketing program i.e. environmental protection, health-care, etc. (Hurlstone et al., 2014). For other variables of persuasiv e messages, the relationship among message appeal, normative message, and self-efficacy message, and behavioural desire are not significant. This finding of study supports the previous studies of Sadeghi,

Fakharyan, Dadkhah, Khodadadian, Vosta and Jafari (2015), that there is a significant relationship between informational appeals and attitude toward advertising whereas it has been found that there is no significant relationship between emotional appeals and attitude toward advertising that influence behaviour (Sadeghi et al., 2015). Therefore, the headline message of Earth Hour 2017 is concerned with informational appeal play in gain message framing of Prospect theory rather than positive and negative emotional appeal play in message appeals of the ELM to attract participants to desire behavioural change. Moreover, the results of this study indicate that there was no significant effect of the descriptive and injunctive normative messages on response to the behavioural desire, in which the majority of people of this study do not behave in line with the desired behaviour or participants see a majority of other people not participating to switch off the light for one hour. According to De Groot, Abrahamse, & Jones (2013), the finding had important practical implication that a lot of pro-environmental behaviour includes actions that are not done by the majority of people, but are regarded as morally correct or a personal norm. And the result shows that self-efficacy message and behavioural desire in energy saving campaign does not have significant relationship according to several studies which have found that environmental desires appear less related to controllability when the campaign is promoted via internet (e.g. Vining & Ebreo, 2002). Participants who perceive that they have little control over changed behaviour and online campaign tend them to feel less pressure for behavioural desire and intention (Dijst, Farag & Schwanen, 2008). For behavioural factors, anticipated emotion and goal desire are important in influencing behavioural desire whereas past behaviour is not because past behaviour of participants who are not differing in environmental attitude, do not substantially affect behavioural intention (Moons & de Pelsmacker, 2012) that would not have been discovered if they were lumped together as an overall group. The findings show that positive anticipated emotion and behavioural desire is not significant whereas negative anticipated emotion has a significant failure action in the goal desire of individuals not to perform. As the study of Kim, Njite and Hancer (2013) investigated that negative anticipated emotion can predict the powerful intention of 411 students to select environmental friendly restaurants, while reducing waste and energy. The decision-making process whether positive or negative anticipated emotion may depend on a target behaviour who have different kinds of behaviour (e.g. whether it is a preventive or a detective behaviour) or different kinds of person (e.g. whether one is promotion or prevention focused) (Rothman & Salovey, 1997; Higgins, 1996). Finally, there is a strong relationship between goal desire and behavioural desire, and behavioural desire and behavioural intention in energy saving campaign according to EMGB model (Perugini & Bagozzi, 2001).

The second objective was to understand the moderating effect of environmental attitude-based segmentation on the relationship between behavioural desire and behavioural intention. This research will identify two groups based on whether respondents have strong attitudinal group labeled as "High Environmental Consciousness" or weak attitudinal group labeled as "Low Environmental Consciousness". Previous studies have used the NEP scale to identify the two extreme segments, namely the "greenest segment" and the "least green segment" (Yilmazsoy, Schmidbauer & Rösch, 2015). The significant difference in willingness to pay (WTP) is between strong and weak pro-environmental attitude groups (Aldrich, Grimsrud, Thacher & Kotchen, 2007). The analyses show both the audience's past behaviour, goal desire, and behavioural desire influence their behavioural intention of high and low environmental consciousness groups, while gain message framing and negative anticipated emotion influence the audience's behavioural intention of high environmental consciousness group. As the previous studies showed, rational advertising appeals or gain framing play an effect on individuals who express a higher awareness about environmental issues and motivation to get involved in environmental protection (Le Hebel, Montpied, & Fontanieu, 2014).

But people who have weak pro-environmental attitude have not yet understood the content of the statements proposed (Ogunbode, 2013). According to the model of EMGB, the power prediction of anticipated emotion influence behavioural desire of high environmental consciousness group. As the previous findings reported that if individuals perceive their peers are responsible for protecting the environment it can lead to feelings of pride and in-group favouritism whereas if they feel their peers are responsible for harming the environment it can lead to feelings of guilt and individual favouritism (Harth, Leach & Kessler, 2013). Furthermore, there are some arguments that negative anticipated emotion may due to negative past experience make individuals encounter environmental risks as well as actually impact life quality (Yates & Stone, 1992). And the more the situational and psychological information in high-experience group, the better fit of behavioural intention with the anticipated emotions whereas in low-experience group with underestimated behavioural expectations lead to the poor fit of behavioural intention with the anticipated emotions (Warshaw & Davis, 1984). According to the model of EMGB, the power prediction of past behaviour, goal desire, and behavioural desire influence their behavioural intention of high and low environmental consciousness groups.

Implications and Recommendations

The empirical findings of this study provide several theoretical and practical implications. For theoretical implications, first, this study fills the gap of the integrative theories which present persuasive messages on behavioural change (Truong et al., 2014). The results can lend impetus to the importance of gain message framing from Prospect Theory influencing behavioural desire in Earth Hour 2017 campaign. Second, the theory of EGMB is proposed in this research to enable decision making more detailed than the TPB. The results can lend impetus to the importance of negative anticipated emotion and goal desire influencing behavioural desire, and also there is mediating effect of behavioural desire and behavioural intention in Earth Hour 2017 campaign. Finally, this study exams the effect of environmental attitude-based segmentation on the structural relationship in determining intention to change behaviour. This study discovers the audience's past behaviour, goal desire influence behavioural desire and intention of high and low environmental consciousness groups, while gain message framing and negative anticipated emotion influenced the audience's behavioural desire and intention of high environmental consciousness group. Overall, respondents who have a positive behavioural desire, tend to have high behavioural intention. For practical implications, the results of study can provide guidelines for public relations/social marketing department of nonprofit organisation and creative agency who creates advertising concept and specifies consumer behaviour in environmental campaign.

Limitations and Suggestions for Future Research

This study has a few limitations. The first limitation is the dependent variable focusing on behavioural intention that may not reflect actual behaviour in the future (Ajzen, 1991) and the limited topic in energy saving campaign. Further research should combine behavioural intention with real behaviour which will be the most successful in identifying persuasive messages and behavioural factors. The second limitation is uncontrollable respondent moods when surveying. Most studies assume that the mood of respondents will be neutral during data collection. Further research should look to new ways to measure and understand sensitive topic related attitude and behaviour by investigating the mood states of sample group who are induced by either a positive, neutral, or negative mood before surveying the questionnaire. The last limitation of the message format on energy saving web banner of Earth Hour 2017, the results may be different from other formats such as image, sound, VDO, etc. The attitude and behaviour of respondents may not be consistent with different periods due to rapid change of technology. In addition, this study focuses on environmental context, the results may not be fully applicable to other social marketing contexts. Further study should increase the generalisability in terms of environmental campaigns such as 3R (reduce-reuse-recycle), wild reservation, green product consumption, etc. and use a combination of message and image to investigate consumer behaviour with high or low environmental consciousness who were affected by cognitive elaboration about the environmental issue (Chan & Han, 2014).

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